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A NEW GENUS AND TWO NEW SPECIES OF FRESHWATER CRABS FROM MÉXICO, *ODONTOTHELPHUSA TONINAE* AND *STYGOTHELPHUSA LOPEZFORMENTI* (CRUSTACEA: BRACHYURA: PSEUDOTHELPHUSIDAE)

Fernando Alvarez and José Luis Villalobos

Abstract.—*Odontothelphusa toninae* is described from the State of Chiapas. This is the third species of the genus *Odontothelphusa,* extending its range to the south and east. *Stygothelphusa lopezformenti,* a new genus and species, is described from northern Oaxaca, and is a cave-dwelling species with advanced modifications for a troglobitic life.

With the new species described in this paper, and others recently published (Alvarez 1989, Rodríguez & Hobbs 1989), the Isthmus of Tehuantepec appears, potentially, as the geographical area with the highest diversity of pseudothelphusid crabs. *Odontothelphusa toninae,* new species, is the third known species of the genus and it is probably the most primitive one, being the most similar to the *Potamocarcinus* line. *Stygothelphusa lopezformenti,* new species, is a cave-dwelling species which is highly modified from the typical pseudothelphusid body plan. Although it does not appear as specialized as the species of the genus *Typhlopseudothelphusa* Rioja, 1952, this new species is in a very advanced stage of adaptation to the cave environment, suggesting an established troglobitic life style. A comparison of the lengthening of appendages is presented between *Typhlopseudothelphusa* and *Stygothelphusa,* new genus, using the same ratios used by Rodríguez & Hobbs (1989). All the specimens are deposited in the Carcinological Collection, Instituto de Biología, Universidad Nacional Autónoma de México (IBUNAM). The gonopod terminology used is that proposed by Smalley (1964) and by Smalley & Adkison (1984). Carapace breadth and carapace length are abbreviated as cb and cl; catalog numbers are preceded by the letters EM which denote an access number; and the abbreviation USNM is for the Smithsonian Institution, National Museum of Natural History, Washington, D.C.

Odontothelphusa Rodríguez, 1982

Remarks.—This genus was proposed by Rodríguez (1982) for a species treated by Pretzmann (1968) as *Potamocarcinus* (*Zilchia*) *maxillipes* (Rathbun, 1898). The character that justified *Odontothelphusa* was the distinctly flattened apical part of the male gonopod with two spines on the mesodistal angle; one larger, strong spine on the mesoproximal angle, and a simple marginal process that does not reach the apex of the gonopod. In contrast, the genus *Potamocarcinus* exhibits a large triangular cephalic tooth and one or two smaller cephalic teeth, the apex of the gonopod is not flattened along a caudocephalic axis, and the marginal process is recurved over the apex. Recently, Rodríguez & Hobbs (1989) described *O. monodontis* from Grutas del Coconá in the State of Tabasco, México, which became the second species in the genus.

Odontothelphusa toninae, new species
Fig. 1

Holotype.—♂, cb 56.4 mm, cl 37.2 mm; small stream passing through the ruins of

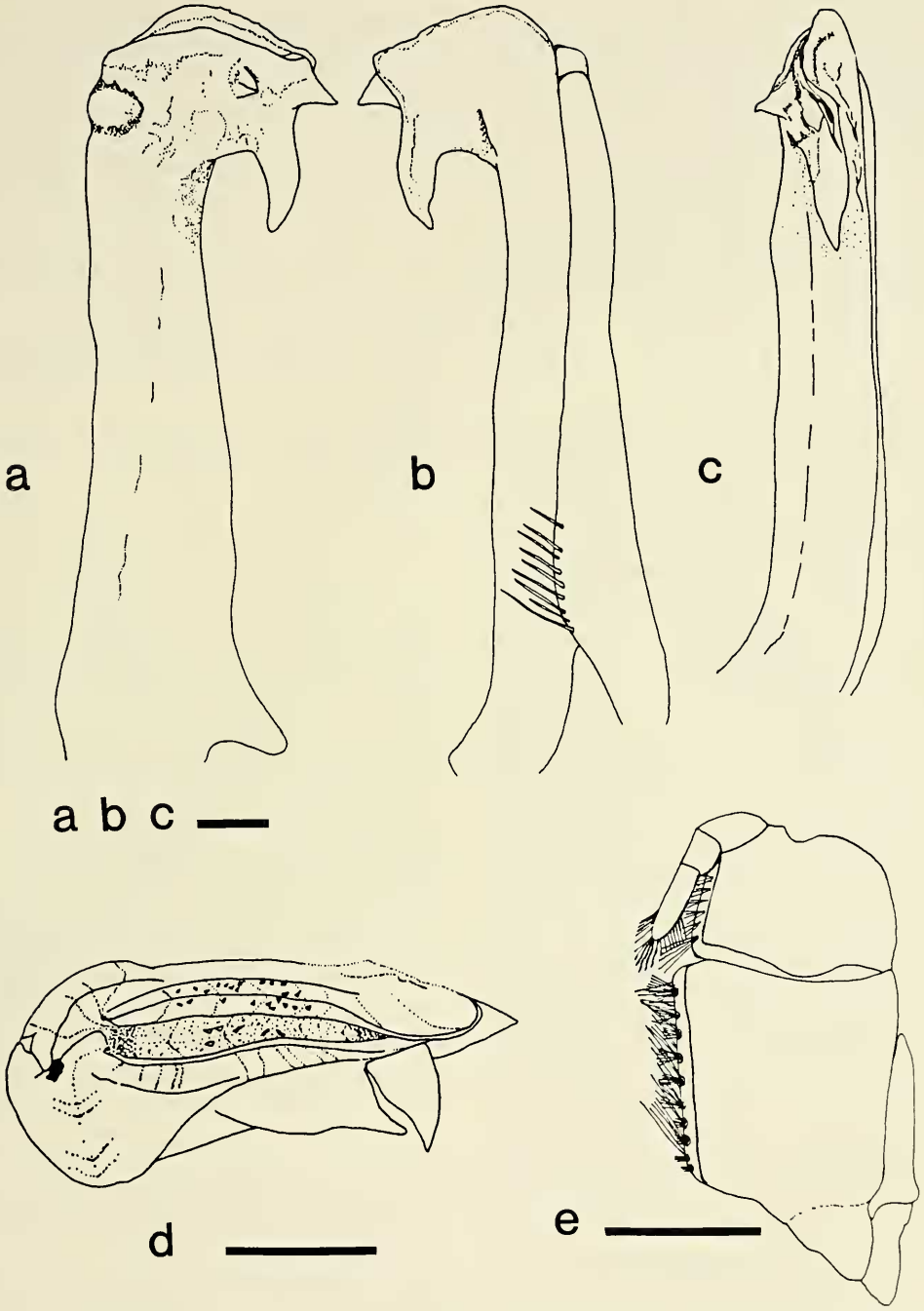

Fig. 1. Left gonopod and left third maxilliped of *Odontothelphusa toninae,* new species: a, lateral view; b, mesial view; c, cephalic view; d, apical view; e, left third maxilliped, outer view. Scale bars: a–d = 1 mm; e = 5 mm.

Toniná, Municipio de Ocosingo, Chiapas (16°53′N, 92°00′W), 8 Apr 1986, colls.: J. L. Villalobos, A. Cantú, and J. C. Nates; IBUNAM EM-7912.

Material examined.—7 ♂ (juveniles), cb 26.1, 25.8, 25.6, 23.1, 18.5, 14.4, 14.4 mm, cl 17.8, 17.5, 17.7, 15.9, 12.8, 10.6, 10.2 mm; 1 ♀, cb 33.4 mm, cl 22.4 mm; same locality and collectors as holotype; IBUNAM EM-7912A. 2 ♂, cb 34.7, 30.3 mm, cl 22.8, 20.6 mm; 4 ♀, cb 47.6, 25.7, 25.3, 20.9 mm, cl 31.2, 17.2, 17.1, 14.5 mm; highway Ocosingo-Palenque km 125, Chiapas (17°01′N, 92°08′W), 9 Apr 1986, colls.: D. Valle and E. Lira, IBUNAM EM-5770.

Description.—Carapace slightly convex. Frontal borders well marked; superior one straight, divided by median groove, inferior one continuous, bilobed in frontal view. Median groove deep and narrow. Postfrontal lobes present as two small elevations. Cervical grooves straight. Notch on anterolateral margin between orbit and cervical groove. Metagastric region limited by lateral depressions. Cardiac and intestinal regions discernible. Merus of third maxilliped with rounded notch on superior margin. Major chela on right side; dactyl teeth decreasing in size distally, propodus with two larger teeth in middle portion. Fingers leaving gap proximally.

Gonopod strong, straight. Large proximomesial spine oriented proximally, creating a hook-like shape. Superior margin of mesial crest straight, rounded caudally, forming a right angle cephalically. Distomesial spine triangular. Conical spine on cephalic surface. Rounded hump on caudal portion of lateral surface. Marginal process straight, short.

Etymology.—The specific name is derived from the Mayan ruins of Toniná, Chiapas, where the species occurs.

Remarks.—Similar to the species of the genus *Pseudothelphusa,* which display a progressive modification of lobes or processes of the male gonopod along a geographic gradient (Alvarez 1989, Rodríguez 1987). The species of *Odontothelphusa* also seem to fit this pattern, being distributed on an east–west axis, from the highlands of Chiapas to the Los Tuxtlas region in Veracruz. The species exhibit a rearrangement of the proximomesial spine towards the west. In addition, *O. monodontis,* occurring west of the range of *O. toninae,* shows a very reduced distomesial spine. *Odontothelphusa toninae* may be the most primitive species of the genus considering that it occurs in the southeastern limit of the range of the genus, and it shows the three cephalic spines that appear in *Potamocarcinus,* from which *Odontothelphusa* may be derived (Rodríguez 1982).

Stygothelphusa, new genus

Diagnosis.—Carapace convex, dorsal surface roughly divided into three regions: one cephalic and two branchial. Width of carapace 1.86 times its length. Front with 2 borders; superior one smooth, bilobed in dorsal view, divided into 2 distinct borders by wide median division; inferior one continuous. Postfrontal lobes present as two small elevations on carapace, distinct depression between gastric and cardiac regions. Cervical grooves straight, wide, shallow, not reaching anterolateral margin of carapace. Forty-four blunt denticles along anterolateral margin between orbit and posterior branchial region. Dorsal margin of orbit with internal section smooth, outer portion with 14 denticles. Shape of orbit atypical, elongated. Eyes complete, cornea pigmented. Third pair of walking legs 1.41 times width of carapace. Merus of third pereiopod 6.82 times as long as broad. Ratios of segments of walking legs as follows: carpus/merus 0.38, propodus/merus 0.60, and dactyl/merus 0.62. Ratio ischium/exopod of third maxilliped 0.37; merus with external margin rounded, internal margin straight. Pterygostomian region covered with setae. Major chela on right side. Merus of cheliped subtriangular in cross section, external mar-

Table 1.—Comparison of some ratios of troglobitic species of the genera *Typhlopseudothelphusa* Rioja, 1952, and *Stygothelphusa,* new genus.

Ratio	*T. hyba*[1]	*T. acanthochela*[2]	*T. mociñoi*[3]	*S. lopezformenti*
Carapace breadth/carapace length	1.46	1.53	1.58	1.86
3rd pereiopod length/carapace breadth	1.60	2.22	1.66	1.41
Segments of 3rd pereiopod				
Carpus/merus	0.35	0.34	0.38	0.38
Propodus/merus	0.66	0.68	0.69	0.60
Dactyl/merus	0.74	0.53	0.57	0.62

[1] Rodríguez & Hobbs (1989).
[2] Holotype (USNM 216239).
[3] Paratype (USNM 93740).

gin with tiny tubercles, internal and inferior margins with well defined spines of uniform size. Interior margin of carpus with typical large spine and 4 smaller spines proximally. Palm of right chela smooth, with distinct ridge on superior margin bearing small granules and spines; inferior margin similar to superior margin. Fingers gaping, dactyl with large proximal tooth, one small tooth proximal to large tooth, 10 small teeth distal to large tooth. Propodus with alternate large and small teeth. Propodus and dactyl slightly curved mesially, covered with small tubercles and spines forming 8 discernible longitudinal rows. For a comparison of ratios between *Stygothelphusa,* new genus, and *Typhlopseudothelphusa,* see Table 1.

Type species.—*Stygothelphusa lopezformenti,* new species.

Etymology.—The generic name is derived from the Latin "stygo" (subterranean waters) and "thelphusa," generic name for freshwater crabs.

Stygothelphusa lopezformenti, new species
Figs. 2, 3

Holotype.—♂, cb 47.2 mm, cl 25.6 mm; Cueva del Brujo, Rancho el Guayabo, 4 km south of Jacatepec, Municipio Valle Nacional, Oaxaca, 8 Oct 1968, coll.: W. López-Forment; IBUNAM EM-10034.

Description.—Gonopod straight and strong. In cephalic view, proximal ⅔ of gonopod twice as thich as distal ⅓. Mesial process semicircular in mesial view, with proximal field of spines; subtriangular in caudal view. In lateral view, gonopod uniformly broad with mesial process protruding distally. Lateral surface with 3 strong spines coming out from lateral crest. Marginal process simple, straight, reaching apex. In apical view, mesial process very prominent, slightly curved laterally, apex cavity elongated, field of setae in cephalic portion, field of small spines in caudal portion.

Etymology.—The species name is derived from the collector's name William López-Forment.

Remarks.—A new genus is proposed due to the unique body proportions found in this crab and to the distinct gonopod morphology. This genus is placed in the Tribe Potamocarcinini based on the following characters: straight gonopod with elongated apical field of spines, and a very large mesial spine [equivalent to the "strong triangular tooth" defined by Rodríguez (1982)]. In posterior view, there are similarities among the gonopods of *S. lopezformenti* and *Potamocarcinus richmondi, P. magnus, P. aspoekorum,* and *P. leptomelus,* namely the position of the marginal process and appearance of mesial process. However, the gonopod's apex is not *Potamocarcinus*-like, resembling more the typical *Pseudothelphusa* morphology. The pereiopods of *S. lopezformenti* are intermediate between those

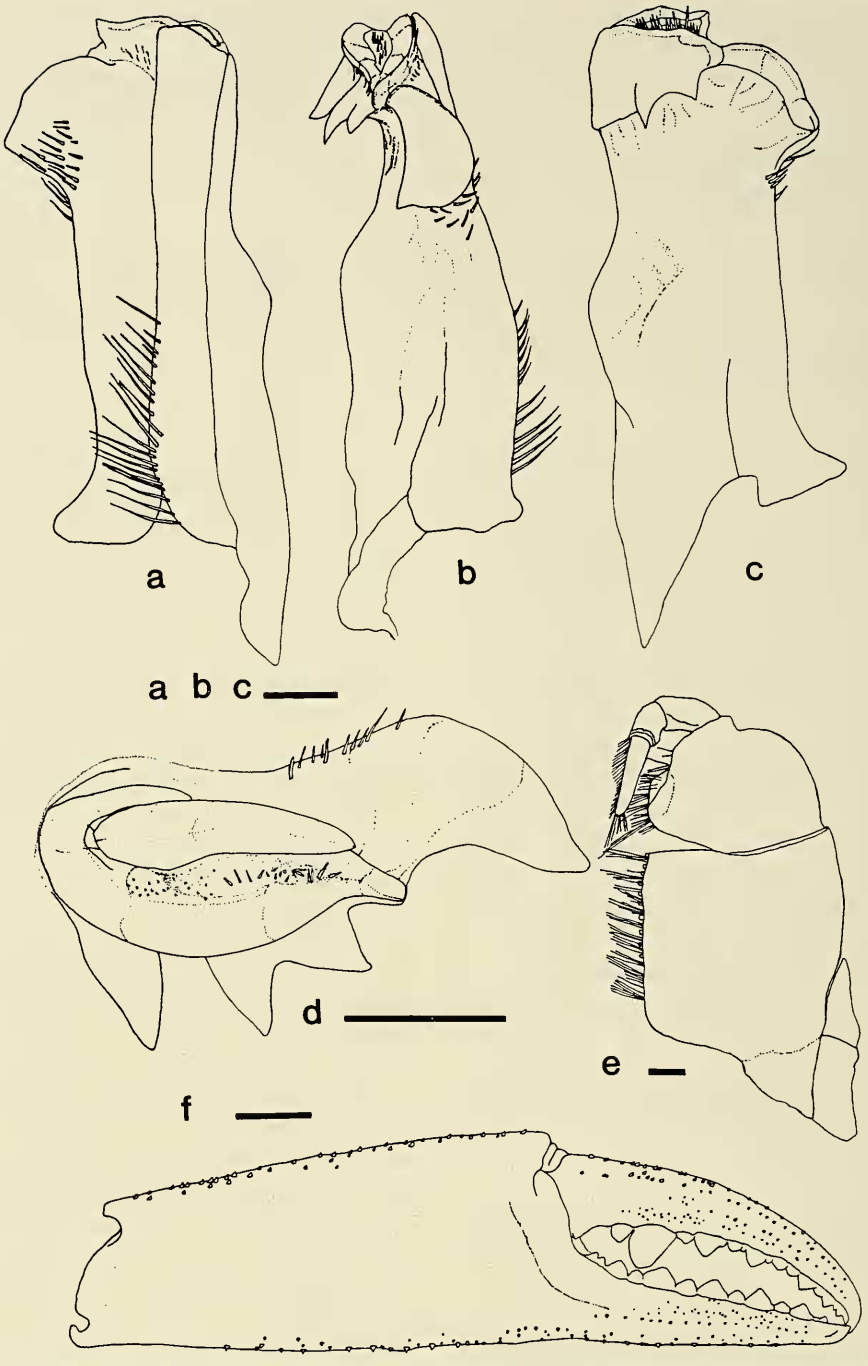

Fig. 2. Left gonopod, left third maxilliped, and major chela of *Stygothelphusa lopezformenti,* new species: a, mesial view; b, cephalic view; c, lateral view; d, apical view; e, left third maxilliped; f, right chela, outer view. Scale bars: a–e = 1 mm; f = 5 mm.

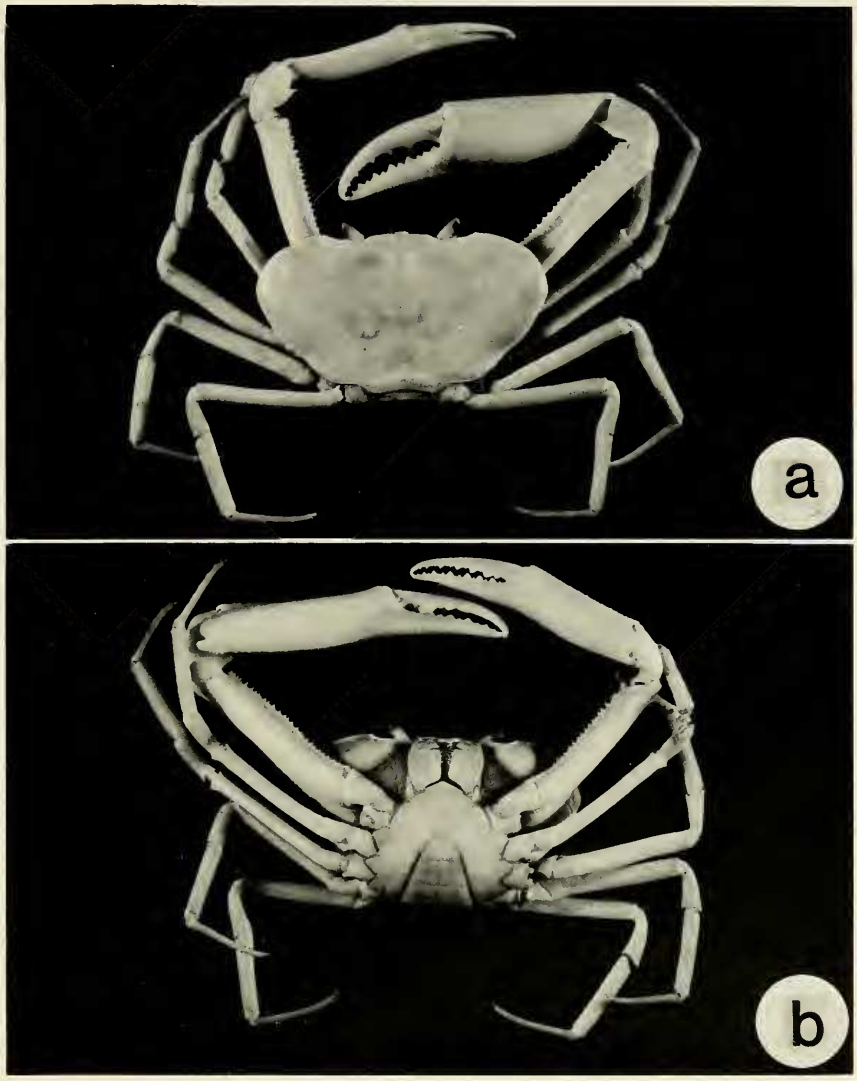

Fig. 3. *Stygothelphusa lopezformenti,* new species. Holotype (cb 47.2 mm): a, dorsal view; b, ventral view.

of the genus *Typhlopseudothelphusa* and those of epigean species. The carapace breadth/carapace length ratio is higher in species of *Stygothelphusa* than in species of *Typhlopseudothelphusa.* However, the ratio of third pereiopod length/carapace breadth exceeds 1.6 in species of *Typhlopseudothelphusa,* whereas in species of *Stygothelphusa* this ratio is lower due to the proportionally wider carapace. In *S. lopezformenti* the eyes are still complete, although the elongation of appendages and the lack of pigmentation suggest a troglobitic life style.

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(FA) Department of Zoology, University of Maryland, College Park, MD 20742. (JLV) Colección de Carcinología, Instituto de Biología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, México D. F. 04510, México.